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### (54) APD BIAS VOLTAGE CONTROL SYSTEM

(57) Abstract:

**PURPOSE:** To secure a constant output voltage level and to avoid deterioration of the high frequency response characteristics of an APD (avalanche photodiode), by using an operational amplifier to an APD bias control circuit for formation of a negative feedback loop.

**CONSTITUTION:** The voltage  $R2 \cdot VOUT / (R1 + R2)$  obtained by dividing the output voltage (APD bias voltage)  $VOUT$  of a DC/DC converter 1 is applied to an inverted input terminal of an operational amplifier. Thus a negative feedback loop is formed. Then the relation of input voltage  $VIN = R2 \cdot VOUT / (R1 + R2)$  is satisfied for a control circuit 2. Thus the output voltage  $VOUT$  of the converter 1 is kept constant by the input voltage  $VIN$  of the circuit 2 regardless of the output current and the output impedance. As a result, it is possible to obtain an APD bias voltage control system having the satisfactory APD high frequency response characteristics.

